

EXHIBIT 2



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(12) **United States Patent**
Sinsky

(10) **Patent No.:** US 7,068,950 B2
(45) **Date of Patent:** Jun. 27, 2006

(54) **CORRECTING MISALIGNMENT BETWEEN DATA AND A CARRIER SIGNAL IN TRANSMITTERS**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 662 days.

(21) Appl. No.: **10/100,521**

(22) Filed: **Mar. 18, 2002**

(65) **Prior Publication Data**

US 2004/0208635 A1 Oct. 21, 2004

(51) **Int. Cl.**

H04B 10/04 (2006.01)

(52) **U.S. Cl.** 398/198; 398/154; 398/159

(58) **Field of Classification Search** 398/66, 398/147, 81, 154, 155, 158, 159, 161, 188, 398/198; 328/150; 375/216, 24, 42; 385/11, 385/122

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,513,249 A * 4/1985 Baghdady 327/356

4,546,322 A *	10/1985	Crutcher	329/308
5,367,536 A *	11/1994	Tsujimoto	375/269
5,418,815 A *	5/1995	Ishikawa et al.	375/216
6,487,352 B1 *	11/2002	Sobiski et al.	385/122
6,496,079 B1 *	12/2002	Pleasant et al.	332/103
6,671,079 B1 *	12/2003	Fuller et al.	359/264
2001/0030791 A1 *	10/2001	Taneda	359/181
2002/0149824 A1 *	10/2002	Baulieu et al.	359/158
2002/0176129 A1 *	11/2002	Dinu et al.	359/110
2002/0191260 A1 *	12/2002	Bergano	359/181
2002/0191261 A1 *	12/2002	Notargiacomo et al.	359/181

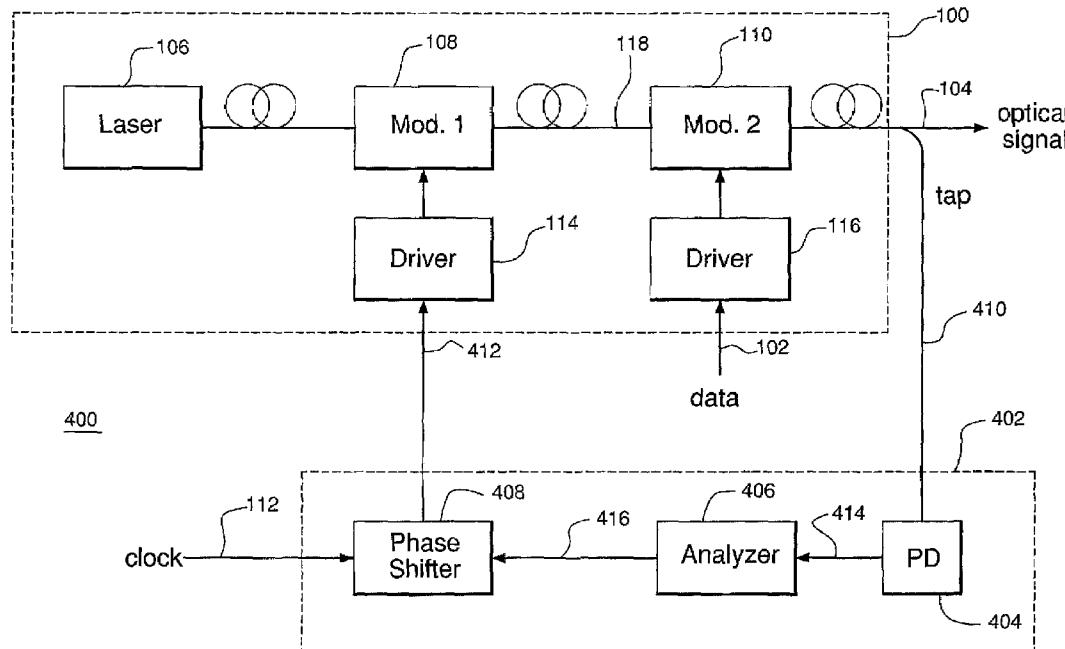
* cited by examiner

Primary Examiner—Christina Y. Leung

(57) **ABSTRACT**

A device and technique for aligning an optical carrier signal (e.g., a soliton pulse train) with a data signal in a transmitter. According to the invention, the device is configured to analyze the radio frequency (RF) spectrum of the transmitter's output. In one implementation, the device evaluates the amount of energy in a certain frequency band located near a selected null of the RF spectrum. In another implementation, the device examines the shape of the RF spectrum within that frequency band. In either case, based on the analysis, the device adjusts the phase of the clock signal driving an electro-optic (E/O) modulator in the transmitter. Such adjustment reduces misalignment between the optical carrier signal and data resulting, e.g., from thermal effects in the E/O modulator. The device may be used, e.g., in long-haul optical transmission systems operating at 10 GBit/s.

36 Claims, 9 Drawing Sheets



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PATENT APPLICATION

APPLICANT: Jeffrey H. Sinsky

CASE NAME: Sinsky 4

TITLE: Correcting Misalignment Between Data and a Carrier Signal in Transmitters

ASSISTANT COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

SIR:

Enclosed are the following papers relating to the above-named application for patent:

1. Check in the amount of \$924.00;
2. Transmittal Letter (1 page);
3. Declaration and Power of Attorney (4 pages);
4. Assignment Recordation Form Cover Sheet (1 page);
5. Assignment (2 pages); and
6. Patent Application with Informal Drawings (1 Cover Page; 8 Pages of Specification; 4 Pages of Claims; 1 Page of Abstract; 9 Sheet(s) of Drawings).

CLAIMS AS FILED				
	NO. FILED	NO. EXTRA	RATE	CALCULATIONS
Total Claims	28 - 20=	0	x \$18 =	\$144
Independent Claims	2 - 3=	0	x \$84 =	\$
Multiple Dependent Claim(s), if applicable			\$280 =	\$
Basic Fee				\$740
			TOTAL FEE:	\$884

METHOD OF PAYMENT OF FEES:A check in the amount of \$924.00 to cover the filing fee and the assignment fee is enclosed.

The Commissioner for Patents is hereby authorized to charge payment of any filing fees for presentation of extra claims under 37 CFR 1.16 and any patent application processing fees under 37 CFR 1.17 during the pendency of this application or credit any overpayment to **Mendelsohn & Associates, P.C. Deposit Account No. 50-0782.**

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